

Invoice

3780 Kilroy Airport Way
Suite 750
Long Beach, CA 90806
P: (562) 590-6500

De Maximis Inc.
186 Center Street, Suite 290
Clinton, NJ 08809

August 26, 2016
Project No: 6664-05
Invoice No: 720548

Project 6664-05 LPR/NB Modeling Program - Developing responses to EPA comments (HD, ST and OC)

Professional Services from May 26, 2016 through August 20, 2016

Phase 1 Hydrodynamic Model Comments

Professional Personnel

	Hours	Rate	Amount	
Senior Engineer/Scientist				
Senior Engineer/Scientist				
Canizares, Rafael	11.00	226.00	2,486.00	
Engineer/Scientist II				
Engineer/Scientist III				
Mathew, Rooni	6.00	183.00	1,098.00	
Engineer/Scientist II				
Mathew, Rooni	54.00	183.00	9,882.00	
Staff Engineer/Scientist				
Staff Engineer/Scientist				
Manian, Dinesh	89.00	121.00	10,769.00	
Totals	160.00		24,235.00	
Total Labor				24,235.00
		Total this Phase		\$24,235.00

Phase 2 Sediment transport Model comments

Professional Personnel

	Hours	Rate	Amount	
Engineer/Scientist II				
Engineer/Scientist III				
Mathew, Rooni	84.50	183.00	15,463.50	
Totals	84.50		15,463.50	
Total Labor				15,463.50
		Total this Phase		\$15,463.50

Phase 4 Meetings

Check Lockbox Account

Payable to: Moffatt & Nichol
P.O. Box 51760
Los Angeles, CA 90051-0068
ClientPayments@moffattnichol.com

ACH / Wire Payment Information

Bank / Account Name: Union Bank / Moffatt & Nichol
Address: 400 California St. San Francisco, CA 94101
Account Number: 4501065066
Fed Routing Number: 122000496

International Wires

Swift Code: Bofcus33mpk

Project	6664-05	LPR/NB Modeling Program - Developing res	Invoice	720548
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Professional Personnel

	Hours	Rate	Amount	
Senior Engineer/Scientist				
Senior Engineer/Scientist				
Canizares, Rafael	12.00	226.00	2,712.00	
Engineer/Scientist II				
Engineer/Scientist III				
Mathew, Rooni	46.50	183.00	8,509.50	
Totals	58.50		11,221.50	
Total Labor				11,221.50
		Total this Phase		\$11,221.50

Phase 5 Collaboration with AQEA

Professional Personnel

	Hours	Rate	Amount	
Engineer/Scientist II				
Engineer/Scientist III				
Mathew, Rooni	67.50	183.00	12,352.50	
Totals	67.50		12,352.50	
Total Labor				12,352.50
		Total this Phase		\$12,352.50
		TOTAL DUE THIS INVOICE		\$63,272.50

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Billing Backup

Friday, August 26, 2016

Moffatt & Nichol

Invoice 720548 Dated 8/26/2016

10:17:08 AM

Project	6664-05	LPR/NB Modeling Program - Developing responses to EPA comments (HD, ST and OC)
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Phase	1	Hydrodynamic Model Comments
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Professional Personnel

			Hours	Rate	Amount
Senior Engineer/Scientist					
Senior Engineer/Scientist					
1548	Canizares, Rafael	7/11/2016	7.00	226.00	1,582.00
1548	Canizares, Rafael	7/28/2016	2.00	226.00	452.00
1548	Canizares, Rafael	7/29/2016	1.00	226.00	226.00
1548	Canizares, Rafael	8/12/2016	1.00	226.00	226.00
Engineer/Scientist II					
Engineer/Scientist III					
2219	Mathew, Rooni	7/25/2016	2.00	183.00	366.00
2219	Mathew, Rooni	7/26/2016	4.00	183.00	732.00
Engineer/Scientist II					
2219	Mathew, Rooni	5/26/2016	8.00	183.00	1,464.00
2219	Mathew, Rooni	6/1/2016	8.00	183.00	1,464.00
2219	Mathew, Rooni	6/2/2016	4.00	183.00	732.00
2219	Mathew, Rooni	6/3/2016	8.00	183.00	1,464.00
2219	Mathew, Rooni	6/6/2016	8.00	183.00	1,464.00
2219	Mathew, Rooni	6/7/2016	8.00	183.00	1,464.00
2219	Mathew, Rooni	6/8/2016	8.00	183.00	1,464.00
2219	Mathew, Rooni	6/10/2016	2.00	183.00	366.00
Staff Engineer/Scientist					
Staff Engineer/Scientist					
2301	Manian, Dinesh	5/31/2016	6.00	121.00	726.00
2301	Manian, Dinesh	6/1/2016	8.00	121.00	968.00
2301	Manian, Dinesh	6/2/2016	6.00	121.00	726.00
2301	Manian, Dinesh	6/3/2016	8.00	121.00	968.00
2301	Manian, Dinesh	6/6/2016	8.00	121.00	968.00
2301	Manian, Dinesh	6/7/2016	8.00	121.00	968.00
2301	Manian, Dinesh	6/8/2016	8.00	121.00	968.00
2301	Manian, Dinesh	6/9/2016	6.00	121.00	726.00
2301	Manian, Dinesh	6/10/2016	6.00	121.00	726.00
2301	Manian, Dinesh	6/13/2016	2.00	121.00	242.00
2301	Manian, Dinesh	6/14/2016	1.00	121.00	121.00
2301	Manian, Dinesh	7/12/2016	3.00	121.00	363.00
2301	Manian, Dinesh	7/13/2016	3.00	121.00	363.00
2301	Manian, Dinesh	7/14/2016	8.00	121.00	968.00
2301	Manian, Dinesh	7/15/2016	8.00	121.00	968.00
Totals			160.00		24,235.00

Total Labor

24,235.00

Total this Phase

\$24,235.00

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Phase 2 Sediment transport Model comments

Professional Personnel

			Hours	Rate	Amount
Engineer/Scientist II					
Engineer/Scientist III					
2219	Mathew, Rooni	7/18/2016	3.00	183.00	549.00
2219	Mathew, Rooni	7/19/2016	2.00	183.00	366.00
2219	Mathew, Rooni	7/20/2016	2.00	183.00	366.00
2219	Mathew, Rooni	7/21/2016	1.50	183.00	274.50
2219	Mathew, Rooni	7/22/2016	5.00	183.00	915.00
2219	Mathew, Rooni	7/26/2016	4.00	183.00	732.00
2219	Mathew, Rooni	7/27/2016	8.00	183.00	1,464.00
2219	Mathew, Rooni	7/28/2016	4.50	183.00	823.50
2219	Mathew, Rooni	7/29/2016	7.50	183.00	1,372.50
2219	Mathew, Rooni	8/1/2016	8.00	183.00	1,464.00
2219	Mathew, Rooni	8/2/2016	8.00	183.00	1,464.00
2219	Mathew, Rooni	8/3/2016	8.00	183.00	1,464.00
2219	Mathew, Rooni	8/4/2016	7.00	183.00	1,281.00
2219	Mathew, Rooni	8/5/2016	8.00	183.00	1,464.00
2219	Mathew, Rooni	8/8/2016	4.00	183.00	732.00
2219	Mathew, Rooni	8/9/2016	4.00	183.00	732.00
	Totals		84.50		15,463.50
	Total Labor				15,463.50
				Total this Phase	\$15,463.50

Phase 4 Meetings

Professional Personnel

			Hours	Rate	Amount
Senior Engineer/Scientist					
Senior Engineer/Scientist					
1548	Canizares, Rafael	6/7/2016	1.00	226.00	226.00
1548	Canizares, Rafael	6/16/2016	1.00	226.00	226.00
1548	Canizares, Rafael	6/20/2016	1.00	226.00	226.00
1548	Canizares, Rafael	6/22/2016	1.00	226.00	226.00
1548	Canizares, Rafael	6/24/2016	1.00	226.00	226.00
1548	Canizares, Rafael	6/27/2016	2.00	226.00	452.00
1548	Canizares, Rafael	7/27/2016	1.00	226.00	226.00
1548	Canizares, Rafael	7/28/2016	3.00	226.00	678.00
1548	Canizares, Rafael	7/29/2016	1.00	226.00	226.00
Engineer/Scientist II					
Engineer/Scientist III					
2219	Mathew, Rooni	6/13/2016	6.50	183.00	1,189.50
2219	Mathew, Rooni	6/14/2016	4.00	183.00	732.00
2219	Mathew, Rooni	6/15/2016	1.00	183.00	183.00
2219	Mathew, Rooni	6/20/2016	3.00	183.00	549.00
2219	Mathew, Rooni	6/21/2016	3.00	183.00	549.00
2219	Mathew, Rooni	6/22/2016	6.50	183.00	1,189.50
2219	Mathew, Rooni	6/23/2016	1.00	183.00	183.00

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Project	6664-05	LPR/NB Modeling Program - Developing res			Invoice	720548
2219	Mathew, Rooni	6/27/2016	3.00	183.00	549.00	
2219	Mathew, Rooni	6/28/2016	6.00	183.00	1,098.00	
2219	Mathew, Rooni	7/1/2016	1.00	183.00	183.00	
2219	Mathew, Rooni	7/11/2016	.50	183.00	91.50	
2219	Mathew, Rooni	7/13/2016	.50	183.00	91.50	
2219	Mathew, Rooni	7/14/2016	.50	183.00	91.50	
2219	Mathew, Rooni	7/20/2016	5.00	183.00	915.00	
2219	Mathew, Rooni	7/22/2016	3.00	183.00	549.00	
2219	Mathew, Rooni	7/25/2016	2.00	183.00	366.00	
	Totals		58.50		11,221.50	
	Total Labor					11,221.50
				Total this Phase		\$11,221.50

Phase 5 Collaboration with AQEA

Professional Personnel

			Hours	Rate	Amount	
Engineer/Scientist II						
Engineer/Scientist III						
2219	Mathew, Rooni	8/8/2016	4.00	183.00	732.00	
2219	Mathew, Rooni	8/9/2016	4.00	183.00	732.00	
2219	Mathew, Rooni	8/10/2016	8.00	183.00	1,464.00	
2219	Mathew, Rooni	8/11/2016	8.00	183.00	1,464.00	
2219	Mathew, Rooni	8/12/2016	7.50	183.00	1,372.50	
2219	Mathew, Rooni	8/15/2016	8.00	183.00	1,464.00	
2219	Mathew, Rooni	8/16/2016	8.00	183.00	1,464.00	
2219	Mathew, Rooni	8/17/2016	8.00	183.00	1,464.00	
2219	Mathew, Rooni	8/18/2016	8.00	183.00	1,464.00	
2219	Mathew, Rooni	8/19/2016	4.00	183.00	732.00	
	Totals		67.50		12,352.50	
	Total Labor					12,352.50
				Total this Phase		\$12,352.50
				Total this Project		\$63,272.50
				Total this Report		\$63,272.50

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Detailed Description of work done by M&N personnel associated to the LPR/NB Modeling Program - Developing Responses to EPA Comments – Scope of Work for the period 05/26/2016 to 08/20/2016 M&N Project No. 6664

Hydrodynamics Principal Investigator - Rafael Cañizares.

Task 1 – Hydrodynamic Model Comments	<ul style="list-style-type: none"> • Prepare invoices for LPR/NB RI FS work orders and prepare accounting for Response to Comments tasks • Review responses to comments for HD model • Prepare budget and coordination for new work order • Review edits to HD report • Coordinate with R. Mathew and D. Manian responses and tasks for HD report
Task 4 – Meetings	<ul style="list-style-type: none"> • Coordinate review of comments • Conference call prepare meeting comments • Prepare project for accounting • prepare multiple invoices LPR/NB and others • coordination with Project Coordinator on invoices and project status. Modify and complete invoices for other LPR Modeling tasks.

Rooni Mathew.

Task 1 – Hydrodynamic Model Comments	<ul style="list-style-type: none"> • Update ST shear stress plots with respect to scour hypothesis • HD text edits for EPA comments • Revise/edit HD report to address EPA comments • Text edits for responses to EPA comments on HD model • Edits to HD report text based on EPA comments
Task 2 – Sediment transport Model comments	<ul style="list-style-type: none"> • ST report edits • Process model outputs to address navigation scour comments • ST report edits for EPA comments, plot tidal average Spring PWCM SSC • ST report & figure edits for EPA comments • Analysis to address comments on entrainment rate analysis • Edits to Gust microcosm attachment



	<ul style="list-style-type: none"> • Develop text/fig edits for Gust microcosm attachment • Develop. text/fig edits for Gust microcosm attachment, fig/text edits for Sedflume attachment
Task 4 – Meetings	<ul style="list-style-type: none"> • Review docs from AQEA, prep for discussion w AQEA on 06/28 meeting with EPA, review OC model code and formulations rel. to EPA comments • Develop material. for Jun 28 meeting • Conference call with AQEA/dmi on Jun 28 meeting, development. • Call with TC on EPA meeting, develop. material. for Jun 28 meeting • Develop. material. for Jun 28 meeting • Finalize material. for EPA-CPG meeting., conference call with AQEA • Attend CPG-EPA meeting on RI report modeling comments • Review/edit modeling comments meeting summary • Respond to AQEA questions on Hg simplification • Coordinate with AQEA • Review/edit RI report response matrix for AQ • Finalize response matrix for AQ
Task 5 – Collaboration with AQEA	<ul style="list-style-type: none"> • Conference call with AQ to discuss additional ST output to address CFT RI comments, ST code changes for additional outputs • ST code changes for additional outputs, rerun V6 calibration • Debug crashed curly2, redo V6 HD run originally on curly2, code changes for additional ST outputs for CFT RI comments • Code review to debug/review outputs, code modifications for additional ST outputs • Plot additional ST results for CFT diagnostics, review model outputs, launch WY2011-2013 runs for additional outputs • Test and transmit additional ST model outputs to AQEA, code changes for AOC sensitive run w EPA approach for dry density • Review AOC code, changes for sensitive with EPA approach for dry density • Changes for sensitivity with EPA approach for dry density & test runs



Dinesh Manian

<p>Task 1 – Hydrodynamic Model Comments</p>	<ul style="list-style-type: none"> • Revised model-data comparisons for 2005 validation period • Computing model performance metrics • Generating revised model-data comparisons and metrics for velocities and salinities • Sensitivity of performance metrics to exact location of the model grid-cell used • Creating revised model-data comparisons for PWCM validation period; • Correcting for observed bias in salinity measurements in presenting model-data comparisons • Revising plots of model bathymetry and wind data; Other minor edits to text • Computing quantitative metrics of model performance for PWCM period • QA/QC of Chant's data used for validation; Attempt at filtering velocity data at 2004 mooring M2b • Investigating possible filtering for velocity data at mooring M2b • Updating figures • QA/QC of flow frequency analysis • Computing correlation coefficients for all statistical comparisons; verifying reported values • Revision of text consistent with updates
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